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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.            | CONFIRMATION NO. |
|---|-------------|----------------------|--------------------------------|------------------|
| 10/621,096  | 07/16/2003  | Robert B. Ford       | 02022 (3600-394-01)            | 9273             |
| 7590 07/26/2005<br>Martha Ann Finnegan, Esq.<br>Cabot Corporation<br>157 Concord Road<br>Billerica, MA 01821-7001 |             |                      | EXAMINER<br>VERSTEEG, STEVEN H |                  |
|   |             |                      | ART UNIT<br>1753               | PAPER NUMBER     |

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/621,096

Applicant(s)

FORD ET AL.

Examiner

Steven H. VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-28,32 and 34-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 37,38 and 40-43 is/are allowed.
- 6) ☒ Claim(s) 1-6,8,9,12-15,19-28,32 and 34-36 is/are rejected.
- 7) ☒ Claim(s) 10,11,16-18 and 39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 4-6, 19-21, 23, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2002/0134675 A1 to Holcomb et al. (Holcomb).

3. For claim 1, Applicant requires a monolithic sputtering target assembly comprising a one piece assembly made from the same metal, wherein said one piece assembly comprises a sputtering target blank portion and a backing plate portion. For claim 2, the metal comprises tantalum. For claim 4, the metal comprises cobalt. For claim 5, the metal comprises titanium. For claim 6, the metal comprises a valve metal. For claim 19, Applicant requires a sputtering target assembly comprising a backing plate and a sputtering target blank wherein the backing plate comprises a valve metal, cobalt, titanium, or alloys thereof, and the target blank comprises a metal. For claim 20, the blank and backing plate comprise the same metal. For claim 21, the blank and backing plate are tantalum. For claim 23, the blank and backing plate are titanium. For claim 24, the blank and backing plate are cobalt.

4. Holcomb discloses a monolithic sputtering target assembly wherein the metal is tantalum, cobalt, or titanium [0009] – [0010]. Because the target is a monolithic target, it is inherent that the backing plate portion and the target are of the same metal.

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5. Claims 1, 5, 8, 12, 19, 20, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,878,250 B1 to Segal et al. (Segal).

6. Claims 1, 5, 19, 20, and 23 are described above. For claim 8, Applicant requires the backing plate portion to comprise a flange portion. For claim 12, Applicant requires the metal to have a purity of 99.5% or greater. Segal discloses a monolithic sputtering target made of pure aluminum (hence, purity greater than 99.5%) or titanium in which the backing plate portion has a flange (Figure 3A).

7. Claims 1-3, 5, 6, 8, and 19-23 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2004/0089543 A1 to Kim.

8. Claims 1, 2, 5, 6, 8, 19-21, and 23 are described above. For claims 3 and 22, Applicant requires the metal to comprise niobium. Kim discloses a monolithic sputtering target assembly (abstract) wherein the backing plate has a flange portion (Figure 3). The target is made from tantalum, niobium, or titanium [0005].

9. Claims 1, 5, 8, 9, and 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2004/0119131 A1 to Turner.

10. Claims 1, 5, and 8 are described above. For claim 9, Applicant requires the blank to be at least partially recrystallized. For claim 13, the average grain size is 300 microns or less. For claim 14, the average grain size is 100 microns or less. For claim 15, the average grain size is 25 microns or less. Turner discloses a monolithic sputtering target [0014] comprising titanium [0015] with an average grain size of 5 microns [0026]. The backing plate portion has a flange (Figure 1).

*Claim Rejections - 35 USC § 103*

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 25-28, 32, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0112955 A1 to Aimone et al. (Aimone) in view of US 2002/0134675 A1 to Holcomb et al. (Holcomb).

13. For claim 25, Applicant requires a method of recycling a sputtering target comprising providing a monolithic sputtering target assembly of claim 1; sputtering the target to form a spent monolithic sputtering target assembly; and recycling the target assembly.

14. Aimone discloses a method of recycling a refractory metal target [0003]. Aimone does not disclose the specific target to be a monolithic target, but can be applied to any general refractory metal target.

15. Holcomb is described above.

16. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Aimone to recycle the tantalum target of Holcomb because of the desire to save money and materials and not have to create a brand new sputtering target.

17. For claim 26, Applicant requires melting down the metal. For claim 27, Applicant requires filling the cavities in the spent target assembly. For claim 28, Applicant requires redepositing metal on the spent target to form a new target. Aimone discloses the limitations [0016] by discussing melting and filling with powders.

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18. For claim 32, Applicant requires a method of recycling a sputtering target comprising providing a monolithic sputtering target assembly of claim 19; sputtering the target to form a spent monolithic sputtering target assembly; and recycling the target assembly. For claim 34, Applicant requires the metal to be consolidated powder metal. For claim 35, Applicant requires the metal to be an ingot derived metal. For claim 36, Applicant requires a portion of the target to comprise consolidated powder and another portion to comprise ingot derived metal. The portion not used (i.e. spent target part) is ingot made, and the added powder is powder metal.

19. Aimone does not disclose the specific target to be a monolithic target, but can be applied to any general refractory metal target.

20. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Aimone to recycle the tantalum target of Holcomb because of the desire to save money and materials and not have to create a brand new sputtering target.

21. Claims 25-28, 32, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0112955 A1 to Aimone et al. (Aimone) in view of US 6,878,250 B1 to Segal et al. (Segal).

22. Claims 25-28, 32, and 34-36 are described above. Aimone and Segal are described above.

23. Aimone does not disclose the specific target to be a monolithic target, but can be applied to any general refractory metal target.

24. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Aimone to recycle the tantalum target of Segal because of the desire to save money and materials and not have to create a brand new sputtering target.

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25. Claims 25-28, 32, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0112955 A1 to Aimone et al. (Aimone) in view of US 2004/0089543 A1 to Kim.

26. Claims 25-28, 32, and 34-36 are described above. Aimone and Kim are described above.

27. Aimone does not disclose the specific target to be a monolithic target, but can be applied to any general refractory metal target.

28. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Aimone to recycle the tantalum target of Kim because of the desire to save money and materials and not have to create a brand new sputtering target.

29. Claims 25-28, 32, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0112955 A1 to Aimone et al. (Aimone) in view of US 2004/0119131 A1 to Turner.

30. Claims 25-28, 32, and 34-36 are described above. Aimone and Turner are described above.

31. Aimone does not disclose the specific target to be a monolithic target, but can be applied to any general refractory metal target.

32. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Aimone to recycle the tantalum target of Turner because of the desire to save money and materials and not have to create a brand new sputtering target.

***Allowable Subject Matter***

33. Claims 10, 11, 16-18, and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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34. Claims 37, 38, and 40-43 are allowed.

35. The following is a statement of reasons for the indication of allowable subject matter: it is neither anticipated nor obvious over the prior art of record to have a monolithic sputtering target assembly as claimed by Applicant in claims 10, 11, 16-18, and 39.

36. Neither Holcomb nor Segal nor Kim nor Turner nor Aimone disclose or suggest part of the backing plate to not be recrystallized, or is more rigid than the blank portion, or the texture of (111) and (100) exist in the target assembly, or that the recycling method involves flame spraying or Osprey. There is no motivation to provide the limitations to the references.

***Response to Amendment***

37. The objection to the specification presented in the office action mailed March 21, 2005 is withdrawn in light of the amendment.

38. The 112-second paragraph rejection of claim 10 is withdrawn in light of the amendment.

39. The 102(b) rejection of claims 1-6, 12, and 16-18 over Dunlop presented in the office action mailed March 21, 2005 is withdrawn in light of Applicant's arguments that Dunlop is not a monolithic target.

40. The 102(e) rejection of claims 1, 5, and 13-15 over Turner presented in the office action mailed March 21, 2005 stands.

41. The 103(a) rejection of claims 1-3, 5-8, 11, 12, and 19-23 over Buehler in view of Nakamori presented in the office action mailed March 21, 2005 is withdrawn in light of Applicant's arguments.

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42. The 103(a) rejection of claim 9 over Buehler in view of Nakamori in further view of Sawada presented in the office action mailed March 21, 2005 is withdrawn in light of Applicant's arguments.

43. The 103(a) rejection of claims 1, 4, 7, 8, 10, 11, 19, 20, and 24 over Buehler in view of Moslehi presented in the office action mailed March 21, 2005 is withdrawn in light of Applicant's arguments.

44. The 103(a) rejection of claim 9 over Buehler in view of Moslehi and further in view of Sawada presented in the office action mailed March 21, 2005 is withdrawn in light of Applicant's arguments.

45. The 103(a) rejection of claims 25-28 and 34-36 over Aimone in view of Dunlop presented in the office action mailed March 21, 2005 is withdrawn in light of the Applicant's arguments.

46. The 103(a) rejection of claims 25-28, 32, and 34-36 over Aimone in view of Buehler in view of Nakamori presented in the office action mailed March 21, 2005 is withdrawn in light of Applicant's arguments.

#### ***Response to Arguments***

47. Applicant's arguments filed June 21, 2005 have been fully considered but they are not persuasive.

48. Applicant has argued that Turner does not disclose a monolithic sputtering target assembly and that the target material is intended to be sputtered with a backing plate. I disagree. Turner specifically states, "it is to be understood that the invention also encompasses monolithic target constructions (i.e. target constructions in which the entirety of a construction is target

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material)” [0014]. Therefore, it is clear that Turner involves monolithic sputtering target assemblies.

### ***General Information***

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Steven H VerSteeg  
Primary Examiner  
Art Unit 1753

shv  
July 22, 2005